





We believe that testing your domestic supply well's water, in addition to ensuring that you document how your well was completed (constructed), is a prudent decision. This testing will not only establish a baseline for the quality of your well's water before the potential mining becomes a real operation, but it will also show how this baseline quality compares to drinking water standards.

The uranium ore deposits that you refer to are naturally occurring, and attest to the chemical changes that took place over many, many years as water flowed within the aquifer, causing the uranium ore to precipitate and adhere to the rock. Precipitation of the uranium ore may be the result of decreased concentrations of oxygen in the water. The areas with the highest concentration of this precipitate become prospective mining sites. Typically, the aquifers that host these prospective mining sites contain dissolved, naturally occurring radioactive elements or minerals in concentrations that may become lower, but still detectable, as the distance from the prospective mining sites increases.

The Texas Commission on Environmental Quality (TCEQ) regulates the uranium in-situ mining operations in Texas, which fall under the authority of the Underground Injection Control (UIC) program. EPA delegated the authority to implement the federal UIC program to TCEQ in the early 1980's, and maintains oversight authority over the state program. TCEQ regulates the wells associated with the uranium in-situ mining operations, and its rules provide for requiring from operators safeguards designed to prevent the contamination of the adjacent aquifer areas during operations.

The risk of contamination that may result from active injection wells is managed with the required monitoring well ring and the requirement that the operator maintain a negative pressure gradient within the mined area. This negative pressure gradient is maintained by withdrawing a volume of fluids from the mined area that is larger than the volume injected into this same area. The ring of monitoring wells helps ensure that the injection operations are not causing fluids from the mined area to migrate towards the adjacent aquifer areas thanks to water sampling in these wells. If at some future point in time you notice significant changes in your water quality, you should contact the TCEQ's regional office in Corpus Christi.

During the uranium in-situ mining process, oxygen is injected, along with other materials, into the aquifer. This action causes the uranium ore found inside the rock formation to become oxidized and turned into a soluble, mobile material that can be brought to the surface through producing wells. Operators are required to conduct restoration operations once the mined area has reached the end of its economic life. At the end of restoration operations, the mined area of the aquifer is left with some amount of soluble uranium and other materials whose concentrations may exceed the baseline concentrations, as noted below. This soluble uranium and materials could potentially migrate beyond the ring of monitoring wells, given the proper flow conditions within the aquifer, once the injection and production operations have ceased and the mining site is

closed. The degree to which the aquifer might be contaminated by this post-operations migration of fluids has been the subject of much discussion.

Arguments have been presented which favor the notion of a minimum risk of contamination spreading to other areas of the aquifer, based on a rationale which assumes that, if and when the plume moves away from the mined area, it will find conditions (a reducing environment with very little or no oxygen) favorable to the precipitation of the dissolved uranium. Once this uranium has precipitated, it has been argued, it will never reach any water supply wells that may be completed in the adjacent areas of the aquifer. However, there is another school of thought, which points out to the fact that the process whereby uranium ore was originally precipitated within a mined area may have taken place over geological time. It also points to the fact that there are no scientific data that may assist in predicting how quickly a reducing environment might develop ahead of the plume's front, and no scientific basis for asserting that, given favorable fluid flow conditions within the aquifer, the plume will not reach the water supply wells before re-precipitation of the remaining uranium dissolved during mining operations occurs.

With respect to your questions, we call your attention to the fact that EPA's drinking water regulations do not apply to private domestic wells. If the sample analysis indicates exceedances of drinking water standards, there are various types of water treatment systems available that could help. However, some of these treatments may result in backwash water that has higher concentrations of radioactive materials. Disposal options for this backwash fluid will have to be considered.

With respect to the track record of uranium in-situ mining operations, EPA has no official documents which would acknowledge any water wells being contaminated by these operations. We do note that, in mined aquifers, it is extremely difficult to restore water quality to baseline levels once mining operations cease. Typically, restoration standards are modified to address this difficulty.